

Appendix A: Watershed Summaries

Preface

California's watersheds supply water for drinking, recreation, industry, and farming and at the same time provide critical habitat for a wide variety of animal species. Conceptually, a watershed is any sloping surface that sheds water, such as a creek, lake, slough or estuary. In southern California, rapid population growth in watersheds has led to increased conflict between human users of natural resources, dramatic loss of native diversity, and a general decline in the health of ecosystems. California ranks second in the country in the number of listed endangered and threatened aquatic species.

This Appendix is a “working” database that can be supplemented in the future. It provides a brief overview of information on the major hydrological units of the South Coast, and draws from the following primary sources:

- The California Rivers Assessment (CARA) database (<http://www.ice.ucdavis.edu/newcara>) provides information on large-scale watershed and river basin statistics;
- Information on the creeks and watersheds for the ESU of the endangered southern steelhead trout from the National Marine Fisheries Service (<http://swr.ucsd.edu/hcd/SoCalDistrib.htm>);
- Watershed Plans from the Regional Water Quality Control Boards (RWQCB) that provide summaries of existing hydrological units for each subregion of the south coast (<http://www.swrcb.ca.gov/rwqcbs/index.html>);
- General information on the ecology of the rivers and watersheds of the south coast described in *California's Rivers and Streams: Working Toward Solutions*. State Water Resources Control Board;
- Interviews with County resource managers and planners;
- The US Environmental Protection Agency's “Surf Your Watershed” (<http://www.epa.gov/surf/hucinfo>) and their index of watershed indicators (<http://www.epa.gov/surf/iwi>);
- The California Environmental Resources Evaluation System (CERES) (<http://ceres.ca.gov>);
- University of California Natural Reserve System (<http://nrs.ucop.edu/reserves.html>); and
- General restoration and conservation plans, materials and information for particular watersheds.

Because the presence of wild southern steelhead trout or salmon is an excellent indicator of the general health and integrity of an aquatic system and watershed, the table below also describes Creeks that contain suitable habitat for the species. The ESU for the southern steelhead includes several Gaviota creeks down to Malibu Creek in the greater Santa Monica Bay watershed.

This section does not include a profile of the wetlands of the south coast (available at CWIS) or data from the California Watershed Projects Inventory. The focus of the Appendix is on the 23 major hydrological units of the south coast, which are depicted below:

Hydrological Units and Watersheds	Associated Wetlands
1. Tijuana River	Tijuana Estuary
2. San Diego Bay (key tributaries: Otay River, Sweetwater River)	South San Diego Bay (including Sweetwater marsh)
3. San Diego River	Famosa Slough
4. Mission Bay (key tributaries: Rose Creek, Tecolote Creek)	Mission Bay (Kendall-Jackson marsh)
5. Los Penasquitos Creek	Los Penasquitos Lagoon
6. San Dieguito River	San Dieguito Lagoon
7. Carlsbad Hydrologic Unit Escondido Creek San Marcos Creek Agua Hedionda Creek Buena Vista Creek	San Elijo Lagoon Batiquitos Lagoon Aqua Hedionda Lagoon Buena Vista Lagoon
8. San Luis Rey River	San Luis Rey River Estuary
9. Santa Margarita River	Santa Margarita River Estuary
10. San Juan Hydrologic Unit San Mateo Creek San Juan Creek Aliso Creek	San Mateo Lagoon
11. Santa Ana Hydrologic Unit San Diego Creek Santa Ana River	Upper Newport Bay, San Joaquin Marsh Santa Ana River Estuary Huntington Beach Wetlands Bolsa Chica Wetlands Anaheim Bay
12. San Gabriel River	Los Cerritos Wetlands
13. Los Angeles River	
14. Ballona Creek	Ballona Wetlands
15. Santa Monica Bay Hydrologic Unit Topanga Creek Malibu Creek Solstice Creek Trancas Creek	Topanga Lagoon Malibu Lagoon Trancas Lagoon
16. Calleguas Creek	Mugu Lagoon
17. Oxnard Plain	Ormond Beach
18. Santa Clara River	Santa Clara River Estuary McGrath Lake
19. Ventura River	Ventura River Estuary
20. South Coast Hydrologic Unit Rincon Creek Franklin Creek 21. Goleta Slough (Atascadero, San Jose, Las Vegas, San Pedro, Carneros, Tecolotito Creeks) 22. Devereux Creek 23. Gaviota Coast Creeks	Carpinteria Salt Marsh Goleta Slough Devereux Lagoon

Watershed	Tijuana River
<i>Existing conditions</i>	<p>The Tijuana River Watershed is a binational watershed on the westernmost portion of the US - Mexico border. The watershed encompasses approximately 1700 square miles (1245 in Mexico and 455 in the US). The basin contains three surface water reservoirs, various flood control works, and a National Estuarine Sanctuary which is home to several endangered species and is protected by the US federal government. The major drainages include Cottonwood and Campo creeks in the US, and the Rio Las Palmas system in Mexico. Annual precipitation varies from less than 11 inches to 25 inches farther inland near the Laguna mountains. Runoff is captured by the Morena Reservoir and Barrett Lake on Cottonwood creek. There are 3 dams in the watershed controlling 78% of the area: Morena was built in 1912 and Barrett in 1922. In Mexico, Rodriguez dam was built in 1936. The watershed includes eight hydrological areas, including the Tijuana Valley, Potrero, Barrett Lake, Monument, Morena, Cottonwood, Cameron, and Campo areas.</p> <p>The major problem in the watershed is poor water quality. Although discharges from the Tijuana River account for only a small percentage of total gauged runoff to the Southern California coastal ocean, it contains the highest concentrations of suspended solids and cadmium (Cd), copper (Cu), nickel (Ni), lead (Pb), and zinc (Zn) among the eight largest creeks and rivers in Southern California. Surface water quality has been affected by runoff from Mexico while ground water contamination has occurred as a result of seawater intrusion and waste discharges.</p> <p>Many of the water quality problems in the Tijuana River watershed are due to diffuse, non-point sources of pollution which may be addressed more effectively through a watershed approach.</p> <p>The water quality problem has worsened in recent years with the substantial growth of Tijuana's population, along with intensive industrial development associated with the maquiladora (in-bond manufacturing and assembly plants) program in Mexico. Moreover, an industrial pretreatment program similar to one implemented in the US has not been initiated in Mexico. No program equivalent to the US EPA's National Pollutant Discharge Elimination System (NPDES) stormwater permitting program exists in Mexico, so the threat of chemical contamination of the Tijuana Estuary is high. Additionally, inadequate infrastructure for the collection, treatment, and disposal of sewage originating in Tijuana has long plagued the watershed, as wastewater flows have chronically outpaced the ability of the infrastructure to handle them. These elements yield transboundary and cross-cultural water quality management challenges.</p> <p>The estuary is one of the largest and most studied wetlands in the South Coast, and is part of the National Estuarine Research Reserve and National Wildlife Refuge programs. The reserve is home to eight threatened and endangered species, including the Light-footed clapper rail, California least tern, Least Bell's vireo, salt marsh bird's beak, white and brown pelicans, and numerous shorebirds.</p>
<i>Description of Watershed Resources</i>	<p>Area: 299640.87 acres Naturally Occurring Waterways: 549.59 miles Percentage of Free Flowing River Miles: 93 % Percentage of River Miles in Protected Lands: 9 % Protected Lands: 7 % Number of Dams: 5</p>

	<p>Number of Stream Crossings: 407</p> <p>Near-Stream Roads: 181.24 miles</p> <p>Average Precipitation per Year: 19.08 inches</p> <p>Percentage Area above 15% Slope: 18.9 %</p> <p>Number of CalWater Units: 18</p> <p>WBS TMDL Rivers 1</p> <p>Number of Special Status Species: 43</p>
<i>Status of Watershed Planning Efforts</i>	<p>The Tijuana River National Estuarine Research Reserve (NERR) encompasses approximately 2,531 acres of tidally flushed wetland, riparian, and upland habitats lying immediately north of the U.S. - Mexico border. These lands are owned and managed cooperatively by the California Department of Parks and Recreation (CDPR), U.S. Fish and Wildlife Service (FWS), the City of San Diego, the County of San Diego, and the U.S. Navy.</p> <p>The reserve encompasses 2,500 acres of beach, dune, mudflat, saltmarsh, riparian, coastal sage and upland habitats. Three quarters of the reserve's watershed is in Mexico. Critical issues confronted by the reserve include habitat restoration, endangered species management, management of wastewater from Mexico, sediment management, and the integration of recreation and habitat conservation and restoration.</p> <p>Hydrological and biological inventories and assessments were conducted and a geographic information system database developed as a foundation for restoration planning. A long-range plan for restoring the estuaries tidal prism and intertidal wetlands was developed and the plan was reviewed in a programmatic EIR/EIS approved and adopted by FWS and the Coastal Conservancy. The plan calls for approximately 500 acres of intertidal wetland restoration to be undertaken in increments using an adaptive management design process, wherein the monitoring and evaluation of projects influence design decisions for subsequent phases.</p>
<i>Restoration Goals and Objectives Related to Wetlands</i>	<p>A major restoration goal for the area is to design and implement an improvement plan for the southern end of the Tijuana River National Estuarine Research Reserve, emphasizing the area of Goat Canyon, that integrates improvements in habitat restoration, resource management, public access, education, law enforcement, research, and monitoring.</p>
<i>List of Major Restoration Activities</i>	<p>In 1989, following the repeated closures at the mouth of the estuary, FWS dredged the north channel of the estuary and reopened the estuary mouth to restore tidal flow. This project improved tidal circulation and promoted the flushing of sediments out of the estuary. Through a permit with the United States Army Corps of Engineers, in conjunction with other regulatory approval, re-dredging of the channels may be performed in response to flood or storm induced closures.</p> <p>A phased tidal restoration program prepared in 1991 includes restoration of approximately 495 acres of tidal wetlands and riparian habitat, and tidal channel improvements. Parts of a phased project to provide secondary treatment and an ocean outfall for raw sewage are at various stages - one is under construction, another is in environmental review.</p> <p>A bi-national GIS mapping project for the watershed was begun in 1994, with the goal of developing basin-wide policies on resource management; data could be incorporated into a complementary effort to gain biosphere reserve status for the watershed, the long-term goal of which is a management plan for the entire watershed.</p>

	<p>A 1,200-foot channel connecting the northern end of Oneonta Slough and the tidal ponds southeast of the visitor center, was constructed in winter 1997. The channel is intended to improve the hydrology of Oneonta Slough, invigorating approximately 200 acres of prime saltmarsh. The Oneonta Tidal Linkage is a project coordinated by the California State Coastal Conservancy, and built by SWIA with funding from FWS and the Coastal Conservancy. The Pacific Estuarine Research Laboratory is conducting an extensive research program as part of the project.</p>
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Watershed	San Diego Bay (key tributaries: Otay River, Sweetwater River)
<i>Existing conditions</i>	<p>The San Diego Bay constitutes the largest estuary along the San Diego coastline, and has been extensively developed as a port. The watershed includes the Sweetwater River and Otay River drainages, small urban creeks (such as the Chollas), stormwater drains flowing directly into the Bay, and portions of Silver Strand and Point Loma. From the Cuyamaca Mountains in the east, traveling to the San Diego Bay in the west, the Sweetwater River watershed encompasses an area of roughly 230 square miles. The Otay River watershed is 160 square miles. Both rivers meander thru rural, suburban, and urban lands. The annual precipitation in the Sweetwater watershed varies from 11 inches along the coast to 35 inches inland. The annual precipitation in the Otay watershed varies from 11 to 19 inches. The lower Otay Reservoir is the terminus of the second San Diego Aqueduct.</p> <p>The San Diego Bay covers 10,532 acres of water and 4,419 acres of tidelands. Only 17 to 18% of the original Bay floor remains undisturbed by dredge or fill. Akin to other major bays of the region, ninety percent of the original salt marshes and 50% of the original mudflats have been filled or dredged for port and urban development. Freshwater contributions to the San Diego Bay come primarily from the Otay and Sweetwater Rivers, but also Telegraph Canyon (south of Sweetwater River Basin), Chollas (north end of Naval Depot south of NASSCO), Switzer (Tenth Ave. Marine Terminal [north end]), Paleta (7th Street Channel, south of Naval Repair Base), and Paradise (south of Paleta) Creeks, as well as some minor drainage groups.</p> <p>Construction of dams and extensive groundwater use in the Sweetwater and Otay drainages reduced the already ephemeral input from those rivers by 76%. Freshwater input is now limited to surface drainage from urban areas and intermittent flows from several rivers and creeks after storms. For about nine months of the year, the Bay receives no significant amount of fresh water.</p> <p>Over 200 storm drain outfalls are located in San Diego Bay. Two rivers and five creeks provide natural drainages into the Bay in addition to the artificial storm drainage system. Stormwater outfalls provide some flows and nutrients to the Bay, but not with natural seasonality, timing, frequency, or content. Sedimentary organic matter is no longer provided to the system except what is available from below the dams on each stream system. How this has affected functioning of the Bay ecosystem has not been examined.</p>
<i>Description of Watershed Resources</i>	<p>Area: 888406.04 acres Naturally Occurring Waterways: 1736.44 miles Percentage of Free Flowing River Miles: 82 % Percentage of River Miles in Protected Lands: 2 % Protected Lands: 3 % Number of Dams: 28 Number of Stream Crossings: 2312 Near-Stream Roads: 970.42 miles Average Precipitation per Year: 17.56 inches Percentage Area above 15% Slope: 14.59 % Number of CalWater Units: 71 WBS TMDL Rivers 4 Number of Special Status Species: 79</p>
<i>Status of Watershed</i>	The San Diego Bay Integrated Natural Resources Management Plan (US Navy 2000) was completed to address priority management actions for the Bay.

<p><i>Planning Efforts</i></p>	<p>A plan is being developed for an Otay River Valley Regional Parkway to provide recreation and protect environmentally sensitive areas as well as cultural and compatible agricultural resources; the area extends 13 miles inland and includes side canyons.</p> <p>The purpose of the comprehensive Sweetwater River Watershed Management Program (http://www.sweetwater.org/habitat/bio_resource_mgmt.html) is to develop a long-term strategy to preserve and protect from further degradation the high quality source waters in the Sweetwater River watershed. To establish habitat, Sweetwater Authority Habitat Management Program:</p> <ul style="list-style-type: none"> • Transplants fully-grown willow trees to riparian areas; • Plants thousands of native plants; • Removes invasive plants from the area. • Monitors the vireo population and its habitat (By 2010, the Authority will provide and maintain 123 acres of habitat), and • Restores managed habitat areas as needed. <p>The eastern shores of the south Bay include the Sweetwater Marsh National Wildlife Refuge (SMNWR). The Sweetwater Marsh NWR is comprised of 4,224 acres of mainly coastal sage scrub, chaparral, riparian woodland, oak woodland, native grasslands, and vernal pools. It supports a rich diversity of native habitats and wildlife. The refuge comprises the Vernal Pools Unit and the Otay-Sweetwater Unit. The Sweetwater Marsh NWR has 316 acres of salt marsh and coastal uplands. The refuge includes the largest emergent wetlands area remaining in San Diego Bay. The Vernal Pools Unit of the NWR provides habitat for six federally listed endangered species (San Diego mesa mint, San Diego button celery, California Orcutt grass, Otay mesa mint, Riverside fairy shrimp, and San Diego fairy shrimp). The endangered Del Mar manzanita, Orcutt's spineflower, and Quino checkerspot butterfly may also occur in the upland habitats surrounding vernal pools.</p> <p>The Otay-Sweetwater Unit provides habitat for the threatened coastal California gnatcatcher, endangered least Bell's vireo, endangered southwestern willow flycatcher, endangered Quino checkerspot butterfly, endangered arroyo southwestern toad, endangered California red-legged frog, and listed species found in vernal pools. The refuge protects tidal marsh and adjacent upland habitat for more than 215 bird species. Two federally endangered species of bird (California tern and light-footed clapper rail), the State endangered Belding's savannah sparrow, and one threatened species of bird (western snowy plover), as well as one endangered species of plant (salt marsh bird's beak) are found here. It is the only place in the United States where yerba reuma (<i>Frankenia palmeri</i>), a member of the heath family common in some coastal marshes of Baja California, grows naturally.</p> <p>There are also a number of other watershed-related restoration efforts, including Caltrans: Carmel Valley Restoration and Enhancement, Caltrans: Del Mar Vernal Pools, Caltrans: I-5 / 54 D Street Marsh, Caltrans: Sweetwater Marsh Restoration, Famosa Slough NPS Treatment Using Constructed Wetlands, San Diego County Russian Thistle Biological Control Project, San Diego County Spotted Knapweed Control, San Dieguito River Valley Regional Open Space Park, Sweetwater River Watershed Management Program.</p>
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<i>Restoration Goals and Objectives Related to Wetlands</i>	<ul style="list-style-type: none"> • Preserve wetland and riparian habitats to protect native species diversity • Remove non-native species • Water quality management
<i>List of Major Restoration Activities</i>	<p>In addition to the Sweetwater Marsh National Wildlife Refuge, the USFWS is interested in expanding the level of protection in the southern part of the Bay. For southern San Diego Bay, the Draft Environmental Assessment and Land Protection Plan (USFWS 1998) evaluates various alternatives and potential environmental effects of establishing an approved Refuge boundary, and acquiring and managing the refuge as wildlife habitat.</p> <p>From October 1999 to March 2000, the San Diego BayKeeper worked in conjunction with the neighborhood group of Paradise Creek, Incorporated to restore the wetland area of Paradise Creek, part of the San Diego Bay watershed.</p>

Watershed	San Diego River
Existing conditions	<p>The San Diego River drains approximately 440 square miles. There are 4 dams within the San Diego River watershed: El Capitan on the main river; San Vicente, Lake Jennings, and Cuyamaca on tributaries. The reservoirs along the river are major water storage facilities for the San Diego metropolitan area. These reservoirs store water that is primarily from the Colorado River. El Capitan stores local water while Cuyamaca Reservoir stores only local runoff. The annual precipitation ranges from less than 11 inches along the coast to 35 inches around Cuyamaca and El Capitan reservoir.</p> <p>The Famosa Slough is a tidal salt water marsh, located on West Point Loma Boulevard between Nimitz and Sports Arena Boulevards. It receives water via the San Diego River Flood Control Channel.</p> <p>Two pairs of breeding light-footed clapper rails were documented in 1995. Special status species found at the slough include the common loon, western grebe, American white pelican, California Brown Pelican, double-crested cormorant, western least bittern, reddish egret, osprey, northern harrier, Cooper's hawk, merlin, American peregrine falcon, Prairie falcon, West snowy plover, elegant tern, California least tern, black skimmer, loggerhead shrike, Belding's Savannah sparrow, large-billed Savannah sparrow, and tricolored blackbird.</p>
Description of Watershed Resources	<p>The following characterization is for the entire San Diego Basin:</p> <p>Area: 888406.04 acres Naturally Occurring Waterways: 1736.44 miles Percentage of Free Flowing River Miles: 82 % Percentage of River Miles in Protected Lands: 2 % Protected Lands: 3 % Number of Dams: 28 Number of Selected Watershed Projects: 20 Number of Stream Crossings: 2312 Near-Stream Roads: 970.42 miles Average Precipitation per Year: 17.56 inches Percentage Area above 15% Slope: 14.59 % Number of CalWater Units: 71 WBS TMDL Rivers 4 Number of Special Status Species: 79 Number of Holland Communities: 33</p>
Status of Watershed Planning Efforts	There is no watershed-based plan for the entire hydrological unit.
Restoration Goals and Objectives Related to Wetlands	<ul style="list-style-type: none"> • Exotic vegetation removal • Water quality control
List of Major Restoration Activities	Data not available.

Watershed	Mission Bay (key tributaries: Rose Creek, Tecolote Creek)
Existing conditions	Mission Bay is an intensively used multi-use area with hotels, marinas, theme parks, and beaches, among other attractions. A rip-rapped channel connects the Bay and the Ocean. The Bay is irregularly shaped, with 2 large islands and depths ranging from 7-20 feet. Circulation in the bay is poor in the eastern portion. The Northern and Southern Wildlife Preserves found in the Bay are tidally influenced. Runoff from approximately 10 square miles of the watershed is conveyed to the bay over the shoreline and through storm drains. There are 69 storm drains that enter the bay, and 3 of those enter into the Northern Wildlife Preserve. A 1994 report characterized the bay's primary water quality problem as contamination from urban runoff combined with poor tidal flushing. The bay was listed in 1994 as an impaired water body.
Description of Watershed Resources	The bay contains three types of aquatic habitats – sandy bottom shallow water, eelgrass beds and rocky shoreline, and two types of intertidal habitats – mudflat and marsh. The aquatic habitat supports over 25 species of marine fish and numerous invertebrates (California Coastal Conservancy 1989). Biological surveys in 1988 found 92 species of which 70 were water-associated and 7 special status species, including nesting California least tern, light-footed clapper rail, Belding's Savannah sparrow, western snowy plover, California brown pelican, peregrine falcon, California gull, and California horned lark. A great blue heron rookery was also found. Twenty species were identified in eelgrass beds in a 1990 report, with arrow gobies, topsmelt, and California halibut dominant.
Status of Watershed Planning Efforts	There is no current watershed-based plan for the entire hydrological unit of the Bay.
Restoration Goals and Objectives Related to Wetlands	<p>Adopted in 1994, the Mission Bay Park Master Plan includes restoration of:</p> <ul style="list-style-type: none"> • Approximately 80 acres of salt marsh adjacent to the Preserve and Rose Creek outfall; • 12 acres of salt marsh at the Tecolote Creek outfall; and • 5 acres of salt marsh on the northeastern side of the north Pacific Passage. <p>Ten acres of salt pan have been created and six least tern nesting sites are protected and actively managed. There is also an active removal program for selected introduced plants at the Preserve. In addition, the City is implementing a number of programs to limit nonpoint source pollution and the San Diego River east of I-5 is the subject of a Habitat Conservation Plan for least Bell's vireo habitat.</p>
List of Major Restoration Activities	See Above.

Watershed	Los Penasquitos Creek
Existing conditions	The watershed encompasses 170 square miles, and extends from Poway (inland) to La Jolla. The tributaries of the watershed, Los Penasquitos Creek and Carmel Creek, flow year-round due to development in the watershed. Miramar Reservoir is the major water storage facility within the watershed, and contains Colorado River water. Annual precipitation ranges from less than 8 inches along the coast to 18 inches inland.
Description of Watershed Resources	Biological inventories in 1994 found 183 species of which 64 were water-associated, including breeding Belding's Savannah sparrows (156 pairs) and one pair of light-footed clapper rails. Special status species include Salt marsh daisy, common loon, western grebe, brown pelican, white-faced ibis, western snowy plover, long-billed curlew, California gull, elegant tern, California gnatcatcher, Cooper's hawk, and peregrine falcon.
Status of Watershed Planning Efforts	There is no watershed plan for the entire hydrological unit.
Restoration Goals and Objectives Related to Wetlands	<ul style="list-style-type: none"> • Restore wetland habitat • Enhance tidal interface
List of Major Restoration Activities	<p>In 1985, an enhancement plan was prepared for the creek (with an update in 1995). The plan requires the City to provide for enhancement of tidal flow at the mouth of the Lagoon by mechanical means (up to 4 times/year). The City is also preparing restoration plans for approximately 24 acres on 2 parcels.</p> <p>In the upper part of the watershed, approximately 3650 acres of Los Penasquitos and Lopez canyons are in the Los Penasquitos Canyon Preserve. The goals for the Preserve are preservation and enhancement of natural and cultural resources.</p>

Watershed	San Dieguito River (including Santa Ysabel and Santa Maria creeks)
Existing conditions	The watershed encompasses 350 square miles, 302 of which are behind dams. Lake Hodges (completed in 1919) and Lake Sutherland (completed in 1954) are the two major dams that block the river. Three tributaries join the San Dieguito River below the dam while 2 other small drainages empty directly into the lagoon basin. San Dieguito River flow is intermittent and the riverbed upstream of tidal influence is often dry. The channel is substantially unarmored except for a concrete block revetment along the upper bank.
Description of Watershed Resources	Special species identified include San Diego horned lizard, orange-throated whiptail, common loon, brown pelican, white-faced ibis, osprey, north harrier, sharp-shinned hawk, Western snowy plover, long-billed curlew, California gull, elegant tern, California least tern, black skimmer, tricolored blackbird, Belding's Savannah sparrow, and California gnatcatcher.
Status of Watershed Planning Efforts	There is no watershed-based plan for the entire hydrological unit.
Restoration Goals and Objectives Related to Wetlands	<ul style="list-style-type: none"> • Restoring tidal interface • Habitat restoration
List of Major Restoration Activities	<p>The Conservancy began an enhancement project in the San Dieguito Slough in 1978, and an enhancement plan was prepared in 1979. During 1983-1984, a 70-acre tidal basin was excavated, Crest Canyon gully was repaired, and the mouth was opened.</p> <p>A conceptual plan for enhancement within the context of a regional river parkway was prepared in 1989, and the lagoon is the intended site for a mitigation project that would involve restoration of 150 acres of tidal wetland and maintenance of the tidal inlet.</p> <p>In 1994, the San Dieguito River Park Joint Powers Authority prepared a conceptual plan for a regional open space park for 55 miles of the river corridor with the goal of preserving and restoring land to protect natural, cultural resources, and provide compatible recreation (1/3 of the land within the planning area is publicly owned).</p> <p>The City of San Diego drafted the San Pasqual Valley Plan (completed in 1994) to resolve issues regarding endangered species habitat, flood control, mining, agriculture, and water quality in the valley.</p> <p>The San Dieguito Wetland Restoration Project is a proposal to implement a tidal wetland restoration project at the San Dieguito Lagoon. This project would restore the aquatic functions of the lagoon through permanent inlet maintenance and expansion of the tidal basin and create subtidal and intertidal habitats on both the east and west sides of Interstate 5 (I-5). This proposal is part of a Park Master Plan being developed that would also provide for non-tidal wetland and upland habitat restoration and public access.</p>

Watershed	Carlsbad Hydrologic Unit (Escondido Creek, San Marcos Creek, Agua Hedionda Creek, Buena Vista Creek)
Existing conditions	<p>The watershed encompasses 210 square miles, and extends from Lake Wohlford to the ocean. The watershed is drained by Buena Vista, Agua Hedionda, San Marcos, and Escondido creeks. The watershed includes the Encinas and Loma Alta hydrological areas. The Buena Vista watershed encompasses 19 square miles while the Escondido creek watershed encompasses 77 square miles and includes the major tributaries of Escondido and La Orilla creeks. The Agua Hedionda creek watershed encompasses 29 square miles. The Loma Alta creek watershed encompasses 20 square miles. The San Marcos creek watershed encompasses 52 square miles. San Marcos Dam, constructed in 1952, controls approximately 53% of the watershed.</p> <p>Urban development (and associated flood control activities), sedimentation from agriculture, erosion, eutrophication of lagoon systems, the presence of exotic species in the watershed, water pollution, and general habitat degradation are major threats to the area.</p> <p>The watershed includes four major coastal lagoons: Buena Vista, Agua Hedionda, Batiquitos (at the mouth of San Marcos creek), and San Elijo (at the mouth of Escondido Creek).</p>
Description of Watershed Resources	<p>There are a number of special status species within the watershed: light-footed clapper rail, California least tern, western snowy plover, Belding's Savannah sparrow, San Diego marsh elder, Common loon, American white and California brown pelicans, double-crested cormorant, white-faced ibis, long-billed curlew, elegant tern, Northern harrier, sharp-shinned hawk, Cooper's hawk, Osprey, and 12 other sensitive bird species nesting in upland areas, including the California gnatcatcher and the Salt Marsh wandering skipper.</p>
Status of Watershed Planning Efforts	<p>A draft Enhancement Plan was prepared by San Diego County in 1995 to recommend methods to preserve and augment a gradient of self-sustaining habitats that range from salt marsh to freshwater marsh.</p> <p>In 1987, the Coastal Conservancy prepared the Batiquitos lagoon watershed sediment control plan. This plan recommended construction of sediment traps but was not implemented.</p>
Restoration Goals and Objectives Related to Wetlands	<p>In 1984, the Coastal Conservancy prepared the Batiquitos lagoon enhancement plan. To mitigate impacts at the Port of Los Angeles, the Port is currently implementing the Batiquitos Lagoon Enhancement Project, which was developed cooperatively with resource agencies and includes some recommendations from the Conservancy plan. The project includes 10 years of monitoring for biota and water quality.</p> <p>Goals and objectives related to the Batiquitos lagoon include:</p> <ul style="list-style-type: none"> • Dredging the lagoon; • Constructing new inlet jetties to keep the mouth open and permanently restoring tidal flows, and • Creating nesting areas for colonial nesting birds including the California least tern and western snowy plover. <p>In 1993, the Soil Conservation Service prepared the Escondido Creek Hydrologic Area</p>

	<p>report, which presented four alternative management schemes for reducing erosion and sedimentation. A draft Enhancement Plan was prepared by the County in 1995 to recommend methods to preserve and augment a gradient of self-sustaining habitats that range from salt marsh to freshwater marsh. San Diego County manages the lagoon and, when funding is available, coordinates the opening of the mouth. There have been 16 artificial openings between 1986-90. The mouth was manually opened again in June 1995. Biological monitoring is carried out before and after mouth openings.</p> <p>In 1983, the Conservancy began working with local cities to lower peak flows and reduce erosion in the Buena Vista Creek and sedimentation of the lagoon. In 1983, 160,000 cubic yards of sediment were dredged from the east basin and 2 least tern nesting islands were created.</p>
List of Major Restoration Activities	The San Elijo Lagoon Tidal Flushing Project restores continuous tidal action to 415 acres of degraded salt marsh through ongoing removal of sand and cobble from the mouth of the lagoon. The project also includes annual monitoring of biological and hydrological conditions.

Watershed	San Luis Rey River
Existing conditions	The watershed encompasses 565 square miles. The San Luis Rey River is the major stream system, and is interrupted by Lake Henshaw, which is one of the subregion's largest water storage areas. Annual precipitation ranges from 12 inches near the coast to approximately 45 inches near the headwaters on Palomar mountain. The watershed is comprised of three hydrological areas: the Lower San Luis, Monserate and Warner Valley areas. Henshaw Dam, built in 1922, controls 36% of the watershed, and three small reservoirs. The mouth of the San Luis Rey River is not listed as an impaired water body.
Description of Watershed Resources	Area: 495650.48 acres Naturally Occurring Waterways: 961.86 miles Percentage of Free Flowing River Miles: 86 % Percentage of River Miles in Protected Lands: 2 % Protected Lands: 3 % Number of Dams: 18 Number of Stream Crossings: 1311 Near-Stream Roads: 509.14 miles Average Precipitation per Year: 18.82 inches Percentage Area above 15% Slope: 14.64 % Number of CalWater Units: 23 WBS TMDL Rivers 0 Number of Special Status Species: 44
Status of Watershed Planning Efforts	<p>The development of a General Resources Plan for the San Luis Rey Watershed began in 1997. In the Fall 1999, the Watershed Status Report was produced by the Resource Conservation District - Upper San Luis Rey Watershed Planning Division.</p> <p>The watershed-based planning effort was funded by the US EPA and the Coastal Conservancy. The goals of this program are to set up a stakeholder- based Watershed Council in the San Luis Rey Watershed, develop a status report for the Watershed (in cooperation with the NRCS Watershed Planning division), prepare a general resources management plan for the Watershed, and begin implementation of the plan.</p>
Restoration Goals and Objectives Related to Wetlands	<ul style="list-style-type: none"> • Removal of exotic species; • Reduce and control water quality problems, nutrient enrichment, and sedimentation; • Management of aquatic habitats, and • Protection of endangered species and plants.
List of Major Restoration Activities	<p>There are also a number of smaller-scale plans underway, including the Carlsbad Highlands - Artichoke Thistle and Tree Tobacco Control, Carlsbad Watershed Network, Development of a General Resources Plan for the San Luis Rey Watershed, Guajome Lake Water Pollution Control and Management Plan, San Elijo Lagoon Water Quality Study, and the San Luis Rey River Water Quality Assessment.</p> <p>The County of San Diego Department of Parks and Recreation is sponsoring the preparation of a management plan for the control and reduction of water quality</p>

	<p>problems, nutrient enrichment problems, and sedimentation along the reach of the San Luis Rey River below Henshaw Dam to Oceanside.</p> <p>A Habitat Conservation Plan was developed for the river's least Bell's vireo population and is currently being implemented. The plan designates 12 acres of riparian habitat west of I-5 as Conserved Habitat.</p>
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Watershed	Santa Margarita River
Existing conditions	<p>The watershed encompasses 750 square miles. The watershed is comprised of the following nine hydrologic areas: the Ysidora, Deluz, Murrieta, Auld, Pechanga, Wilson, Cave Rocks, Aguanga, and Oak Groves. This watershed is drained largely by the Santa Margarita River, Murrieta Creek and Temecula River. The precipitation within the watershed ranges from 12 inches on the coast to 45 inches at the headwaters on Palomar Mountain. Twenty-seven miles of free-flowing river exist. Lake O'Neill is out of the River channel but receives much of its water from seasonal river diversions. Two dams are located in the upper watershed along the two streams that join to form the Santa Margarita River. The river is included in the list of impaired water bodies.</p> <p>It is the least disturbed river system south of the Santa Ynez River in Santa Barbara County, and contains some of the largest remaining populations of several bird species, including the Least Bell's vireo and the largest concentration of least terns in the world (State Coastal Conservancy 1989). Unlike most of the rivers of the South Coast, the riparian habitat is of particularly high quality, and are essential for the protection of waterfowl and a number of endangered plants and animals.</p> <p>As late as 1958, steelhead trout were reported near the mouth of the estuary.</p>
Description of Watershed Resources	<p>Area: 473562.21 acres Naturally Occurring Waterways: 1033.46 miles Percentage of Free Flowing River Miles: 92 % Percentage of River Miles in Protected Lands: 5 % Protected Lands: 6 % Number of Dams: 9 Number of Selected Watershed Projects: 4 Number of Stream Crossings: 1488 Near-Stream Roads: 497.6 miles Average Precipitation per Year: 16.07 inches Percentage Area above 15% Slope: 9.38 % Number of CalWater Units: 33 WBS TMDL Rivers 0 Number of Special Status Species: 45</p>
Status of Watershed Planning Efforts	<p>The Santa Margarita River Watershed Management Program was formed in 1989 to protect stream related resources of the watershed. The Program includes 50 federal and state resource agencies and a number of private and nongovernment interest groups.</p> <p>Various sensitive lands in the watershed have been preserved as open space and as an ecological reserve by both private and public landowners (http://www.scec.sdsu.edu/BFS/main/SMER/SMER.html).</p> <p>Working with the US Fish and Wildlife Service, the Marine Corps has developed an ecosystem management plan to ensure that Base training activities are compatible with endangered species habitat needs. Numerous studies and management projects include a cooperative effort among San Diego and Riverside counties, and federal and state agencies and community groups to develop a watershed plan focusing on land uses, such as flood control, erosion, sedimentation and the long-term effects of urbanization on the river's habitats; other enhancement and education efforts are also underway in</p>

	sub-watersheds.
Restoration Goals and Objectives Related to Wetlands	<p>With respect to the watershed management program, the primary areas of interest include:</p> <ul style="list-style-type: none"> • Maintenance of water quality and quantity; • Protection of wildlife and sensitive species, and • Management of stream corridors for multiple uses.
List of Major Restoration Activities	<p>The Conservancy has funded 3 enhancement efforts that focus on integrated watershed planning and management for the three primary subbasins of the watershed (Temecula, Murrieta and the main stem of the Santa Margarita River).</p> <p>The Santa Margarita River Exotics Control Program is attempting to eliminate giant reed and salt cedar in the river.</p>

Watershed	San Juan Hydrologic Unit (, San Juan Creek, Aliso Creek, San Mateo Creek)
Existing conditions	<p>The San Juan hydrological unit encompasses about 500 square miles. The three major creeks are Aliso, San Juan and San Mateo Creeks. Precipitation in the watershed ranges from 12 to 14 inches/year. The sub-watershed of Aliso creek is an area approximately 36 square miles. The watershed includes important habitat for the California gnatcatcher (coastal sage scrub), least Bell's vireo (marsh).</p> <p>San Juan creek is the longest creek in the hydrological unit. The mouth of the creek is located at Doheny Beach State Park. The San Juan Creek watershed encompasses a drainage area of 176 square miles extending from the Cleveland National Forest in the Santa Ana Mountains to the Pacific Ocean at Doheny State Beach near Dana Point Harbor. San Juan Creek is approximately 27 miles long with a peak elevation of 5,700 feet. Major tributaries of the watershed include Trabuco Creek, Horno Creek, Canada Gobernadora, Canada Chiquita, Verdugo Wash, Lucan Canyon, Cold Spring Canyon, and Hot Spring Canyon. Oso Creek, Hickey Canyon Creek, Live Oak Canyon Creek are major tributaries to Trabuco Creek. There are two major dams, Oso Reservoir and Mission Viejo Lake on Oso Creek.</p> <p>The Oso Creek and Trabuco Creek watersheds have been most affected by development. Watershed concerns include channelization, poor surface water quality from discharge of non-point sources, loss of habitat in the floodplain, loss of riparian habitat, paving of the flood plain, decline of water supply and flows, biodiversity loss, invasive species, surface erosion, and over use of existing resources.</p> <p>The Aliso Creek watershed is located in Southern Orange County, and encompasses a drainage area of approximately 36 square miles. The watershed extends 19 miles from the foothills of the Santa Ana Mountains to the Pacific Ocean south of Laguna Beach, and includes the tributaries of Wood Canyon, Sulphur Creek, Aliso Hills Channel, Dairy Fork, Munger Creek, and English Canyon. Residential developments within the watershed include portions of Lake Forest, Laguna Beach, Foothill Ranch, Porola Hills, Mission Viejo, Laguna Hills, Aliso Viejo, and Laguna Niguel.</p> <p>The majority of the watershed is urbanized with residential development of up to 18 units per acre. Watershed concerns are similar to those described above for Oso and Trabuco Creeks.</p> <p>The San Mateo Creek watershed encompasses 132 square miles. Portions of the creek and marsh are managed by the State Department of Parks and Recreation, and are located on Camp Pendleton.</p>
Description of Watershed Resources	<p>The watershed is identified by the USGS as the Aliso Creek Watershed, and is described as follows:</p> <p>Area: 317666.82 acres Naturally Occurring Waterways: 771.11 miles Percentage of Free Flowing River Miles: 96 % Percentage of River Miles in Protected Lands: 13 % Protected Lands: 13 % Number of Dams: 12 Number of Stream Crossings: 934 Near-Stream Roads: 411.71 miles</p>

	<p>Average Precipitation per Year: 16.42 inches</p> <p>Percentage Area above 15% Slope: 16.26 %</p> <p>Number of CalWater Units: 10</p> <p>WBS TMDL Rivers 1</p> <p>Number of Special Status Species: 36</p>
Status of Watershed Planning Efforts	<p>There is no watershed-based plan for the entire Aliso Creek watershed.</p> <p>The Aliso Creek Watershed Management Study (COE 1998a) provides a trend and analysis of the ecology of the watershed. The feasibility study also identifies opportunities to address watershed management from a basin-wide perspective. Issues investigated in the study are land use, hydrology, hydraulics, flooding, river geomorphology, erosion, sedimentation, geology, soils, water quality, groundwater, vegetation, endangered species, and cultural resources.</p> <p>The San Juan Creek Watershed Management Study (COE 1998b) reviews and assesses past and current activities, and trends in the watershed. The feasibility study also identifies opportunities to address watershed management from a basin-wide perspective. Issues investigated in the study are land use, hydrology, hydraulics, flooding, river geomorphology, erosion, sedimentation, geology, soils, water quality, groundwater, vegetation, endangered species, and cultural resources.</p>
Restoration Goals and Objectives Related to Wetlands	See below.
List of Major Restoration Activities	<p>A population of approximately 8 acres of German Ivy has become established within the Trestles Wetlands Natural Preserve at San Onofre State Beach. This infestation threatens to overtake known least Bell's vireo breeding habitat. The spraying of herbicide occurred in March 1997 and is being repeated this year to ensure eradication.</p> <p>The San Juan Creek Mining Reclamation Project aims to provide visual screening of mined lands, restore the character and appearance of affected streambanks, and maintain opportunities for future extraction as the alluvium in the flood plain is replenished.</p> <p>The Mission Viejo Materials Incorporated Restoration Project will create 10 acres of coastal sage scrub and riparian habitat for the California gnatcatcher and least Bell's vireo.</p>

Watershed	Santa Ana Hydrologic Unit (San Diego Creek, Santa Ana River)
Existing conditions	<p>This hydrologic unit includes the San Diego Creek watershed that flows to Newport Bay, and the Santa Ana River watershed. Both are described below as distinct hydrological units.</p> <p>The San Diego River Watershed encompasses about 154 square miles. San Diego creek is the largest drainage system in the watershed, draining roughly 118 square miles, including a number of cities and unincorporated areas. San Diego Creek and the Upper Newport Bay Ecological Reserve are two major waterbodies in the watershed listed as impaired due to water quality impacts from nutrients. Nutrient loads from the agricultural, residential, and commercial land uses as well as from point source discharges flow from upper San Diego Creek into the lower Creek and Upper Newport Bay. The nutrient-laden loads cause algal blooms and eutrophic conditions in the poorly flushed areas of the watershed.</p> <p>NEWPORT BAY. The watershed encompasses 154 square miles. The two tributaries to the watershed are San Diego Creek and Bonita Creek. San Diego Creek accounts for about 80% of the Newport Bay watershed area. The other drainage areas include the Santa Ana-Delhi Channel, Big Canyon and some additional small tributaries. All of the channels empty into the Newport Bay, a coastal estuary of ecological significance known as the Upper Newport Bay Ecological Reserve. San Diego Creek accounts for over 90 percent of the sediment delivered to the Bay.</p>
Description of Watershed Resources	<p>NEWPORT BAY.</p> <p>Area: 101142.97 acres</p> <p>Naturally Occurring Waterways: 146.34 miles</p> <p>Percentage of Free Flowing River Miles: 60 %</p> <p>Percentage of River Miles in Protected Lands: 0 %</p> <p>Protected Lands: 0 %</p> <p>Number of Dams: 19</p> <p>Number of Stream Crossings: 288</p> <p>Near-Stream Roads: 117.63 miles</p> <p>Average Precipitation per Year: 13.18 inches</p> <p>Percentage Area above 15% Slope: 1.9 %</p> <p>Number of CalWater Units: N/A</p> <p>WBS TMDL Rivers 0</p> <p>Number of Special Status Species: 15</p>
Status of Watershed Planning Efforts	<p>There are a number of watershed-related plans for the Newport Bay Basin, including Crystal Cove Coastal Sage Scrub Revegetation Project, Crystal Cove State Park Coastal Sage Scrub Restoration, Newport Bay Watershed, Siphon Reservoir Coastal Sage Scrub Revegetation Project , Upper Newport Bay / San Diego Creek Watershed Nutrient Total Maximum Daily Load, Upper Newport Bay Watershed Water Quality Enhancement Project.</p> <p>Several federal, state, regional and local programs (described briefly below) identify and prioritize water quality problems in the Newport Bay watershed and develop implementation strategies to address those problems on a watershed basis, especially for "non-point" sources.</p> <p>The Upper Newport Bay / San Diego Creek Watershed Nutrient Total Maximum Daily</p>

	<p>Load focuses on water quality/beneficial use impacts caused by the nutrients and will attempt to alleviate these impacts by: 1) the development of a Newport Bay/San Diego Creek Watershed phased nutrient total maximum daily load (TMDL) 2) the evaluation and recommendation of possible revision of nutrient water quality objectives specified for San Diego Creek in the Basin Plan, and 3) a determination for the need for nutrient water quality objectives specific to Upper Newport Bay. A Newport Bay Strategy (developed in 1989) identified nutrients that needed to be controlled as part of the Regional Board's approved comprehensive management strategy of implementation for the Newport Bay Watershed.</p> <p>The Upper Newport Bay Ecosystem Restoration Feasibility Study (May 2000) addresses the issues related to continued sedimentation problems within the Bay, and the direct effects of sedimentation on the habitats and species that make up the ecological reserve. The study does not identify any alternative measures for the watershed. The Corps and the County of Orange have initiated a separate watershed feasibility study to develop a watershed management plan for the Bay, and to investigate site-specific restoration opportunities within the watershed (County of Orange 2000).</p>
Restoration Goals and Objectives Related to Wetlands	<p>The Upper Newport Bay Watershed Water Quality Enhancement Project addresses problems related to sedimentation and eutrophication. The goals of the project are:</p> <ul style="list-style-type: none"> • To identify and reduce or eliminate sources of aquatic life toxicity in the watershed; • To identify and reduce or eliminate sources of excessive bioaccumulative chemicals in the watershed; • To contain and reduce or eliminate sources of excessive vegetative debris in the watershed; • To contain and reduce or eliminate sources of excessive urban trash in the watershed, and • To develop educational tools related to the project that are broadly applicable to watersheds with similar impairments.
List of Major Restoration Activities	<p>San Joaquin Marsh Enhancement - Phase I Enhance approximately 50 acres of existing freshwater marsh habitat on the San Joaquin Freshwater Marsh Reserve as part of an effort to restore the natural gradient found historically at Southern California coastal wetlands. One of the main features of the project site is a series of former duck ponds, which have become filled with sediment and vegetation over the years, due in part to the lack of a consistent water supply that can be managed to sustain a variety of marsh habitats. The project focuses on restoring these ponds, developing a water intake and distribution system, and re-establishing native vegetation. Construction was completed in January 2000, and coastal sage scrub planting will follow construction.</p> <p>Huntington Beach Acquisition of Edison Property A 20 acre parcel of the Huntington Beach wetlands adjacent to the power plant will be acquired via a purchase agreement with Edison. The Coastal Conservancy will give funds to the Huntington Beach Wetlands Conservancy to complete the acquisition.</p>

Watershed	Santa Ana River
Existing conditions	The Santa Ana River watershed encompasses 2,800 square miles. The Santa Ana River is one of the largest rivers in southern California. Channelization with high levee banks and other flood control measures upstream have greatly reduced the river as a source of seasonal flood-waters to the marshes. A second tributary, the Greenville-Banning Channel, joins the Santa Ana River. Flows are composed of storm water discharge and urban run-off. The two major dams are Prado Dam (1941) and Seven Oaks Dam (completed in 1998).
Description of Watershed Resources	<p>SANTA ANA BASIN</p> <p>Area: 1082540.16 acres</p> <p>Naturally Occurring Waterways: 2033.44 miles</p> <p>Percentage of Free Flowing River Miles: 75 %</p> <p>Percentage of River Miles in Protected Lands: 3 %</p> <p>Protected Lands: 4 %</p> <p>Number of Dams: 52</p> <p>Number of Selected Watershed Projects: 36</p> <p>Number of Stream Crossings: 2916</p> <p>Near-Stream Roads: 1096.1 miles</p> <p>Average Precipitation per Year: 20.45 inches</p> <p>Percentage Area above 15% Slope: 25.68 %</p> <p>Number of CalWater Units: 43</p> <p>WBS TMDL Rivers 17</p> <p>Number of Special Status Species: 73</p>
Status of Watershed Planning Efforts	<p>There is no watershed plan for the entire hydrological area.</p> <p>The Santa Ana Watershed Project Authority (SAWPA) was formed in 1971 to develop a long-term plan to manage the area's water supply, and finance and build multi-agency water projects. SAWPA historically focused on water quality and ground water. In 1994, the Authority broadened its focus and participation to include issues of flood control, wildlife resources and interaction with other water agencies.</p>
Restoration Goals and Objectives Related to Wetlands	<ul style="list-style-type: none"> • Wetland enhancement; • Permanently restoring tidal flows, and • Protection of species of concern.
List of Major Restoration Activities	<p>As part of the Santa Ana River flood control project, the COE began restoration of 92 acres of marsh in 1989 as mitigation for biological impacts. In 1991, Orange County adopted an Enhancement Plan for South Talbert and Fairview/North Talbert parks, (renamed Talbert Nature Preserve in 1995) which included wetland enhancement. Restoration work on the northern portion of the Preserve and around Victoria Pond were completed in 1996.</p> <p>The Talbert Nature Preserve is impacted from the adjoining developed recreation areas to the north, limited flooding events, and poor water quality from the mesa urban run-off. The loss of salt marsh flora and fauna continues at the Mobil Oil site due to the absence of tidal waters.</p> <p>A sample of planning efforts in this area include the Lake Mathews Multi-Species</p>

	<p>Habitat Conservation Plan / NCCP, Prado Wetlands, Rathbun Creek Watershed Restoration Project, Santa Ana River Use Attainability Analysis, and the Southwestern Riverside County Multi-Species Habitat Conservation Plan.</p> <p>The Santa Ana Regional Interceptor (SARI) Program will construct a pipeline to convey 30 million gallons of wastewater daily from the upper reaches of the watershed in San Bernardino to Fountain Valley near the ocean. The purpose of the project is to transport non-reclaimable wastewater (high saline wastewater) from the Upper Santa Ana River Basin to the ocean for disposal, after treatment, and to recover and protect water resources in the watershed.</p>
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Watershed	San Gabriel River
Existing conditions	<p>The San Gabriel River watershed encompasses 661 square miles acres and 828 miles of waterways. There are 26 dams in this watershed. Most of these dams were built in the after the 1930s, such as the Cogswell Dam (1934), San Gabriel Dam (1939), and Morris Dam (1934), among others. Six additional dams are located on tributaries to the San Gabriel River. The lower part of the River (the area generally below Santa Fe Dam) is channelized and developed for much of its length except for at recharge basins where the bottom is gravelly and in the tidal prism where the bottom is muddy and some habitat subsists. Many tributaries to the river originate in the San Gabriel Mountains and often have year-round flow in the foothills due to springs and support high quality habitat.</p> <p>(Los Cerritos is actually in its own watershed separate from the San Gabriel River, except for a minor cross-connection due to the powerplants on the San Gabriel River pulling in water from Long Beach Marina. It drains Paramount, and parts of Long Beach, Signal Hill, Bellflower, Lakewood, and other areas to Los Cerritos Channel and thence to Marine Stadium and Alamitos Bay (including Long Beach marina) before reaching the ocean. A jetty separates the mouth of the San Gabriel from the mouth of Alamitos Bay) Historically the watershed of the Los Cerritos Channel was part of the San Gabriel River watershed. It is not almost completely hydrologically disconnected from the San Gabriel River. The Los Cerritos Channel watershed is 28 square miles.</p>
Description of Watershed Resources	<p>Area: 453,960 acres Naturally Occurring Waterways: 827.52 miles Percentage of Free Flowing River Miles: 79 % Percentage of River Miles in Protected Lands: 19 % Protected Lands: 17 % Number of Dams: 26 Number of Selected Watershed Projects: 5 Number of Stream Crossings: 1405 Near-Stream Roads: 692.17 miles Average Precipitation per Year: 22.2 inches Number of Special Status Species: 20</p>
Status of Watershed Planning Efforts	<p>There are a number of watershed planning efforts in various stages of development. Proposition 13 funds are going toward subwatershed plan development in Coyote Creek, and the upper part of the watershed including Walnut and San Jose Creeks. These efforts have just begun.</p> <p>A San Gabriel River Master Plan is currently being developed that will be a consensus-based document recognizing and addressing River issues and concerns of the stakeholders. It will include areas within existing rights-of-way from Morris Dam in the mountains to the River's outlet. The Plan will identify project opportunities for: enhancements for recreation, open space and habitat areas; restoration; preservation of the River's natural resources; maintaining flood protection and existing water rights. The Plan is expected to be ready for Board of Supervisor approval by 2003. It will be coordinated with the activities of the San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy. Information on the Master Plan may be found at</p>

	<p>http://ladpw.org/pln/sgrmp.</p> <p>The San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy has produced a draft Guiding Principles Watershed and Open Space Plan which may be viewed at http://www.rmc.ca.gov/. The Conservancy was established in 1999 as an independent State agency to preserve urban open space and habitats in order to provide for low-impact recreation and educational uses, wildlife and habitat restoration and protection, and watershed improvements within its jurisdiction.</p> <p>The Los Angeles and San Gabriel Rivers Watershed Feasibility Study Advisory Task Force has recently developed recommendations for consideration by the Board of Supervisors for restoration opportunities in the two watersheds. The Task Force was formed in 1998 to identify opportunities to improve recreation, land use and habitat management, watershed conservation, water quality and flood control and to develop a framework for a future integrated basin management plan for the two watersheds.</p>
Restoration Goals and Objectives Related to Wetlands	<p>An amendment to the Specific Plan proposed in 1996 includes a reconfiguration of the wetlands (filling in some areas, restoration and creation in others) that would result in an overall increase of 3 acres of wetlands. A permanent tidal connection would also be created and urban runoff would be rerouted to avoid the salt marsh. The amendment also includes a 90% reduction in allowable housing units in the area.</p>
List of Major Restoration Activities	<p>A number of small land conservancies have formed to prevent the development of the San Gabriel Mountains just below the Angeles National Forest.</p> <p>The Los Angeles and San Gabriel Rivers Watershed Feasibility Study Advisory Task Force the Board of Supervisors request the Army Corps of Engineers begin startup work for the top three sites (by the defined criteria) recommended by the Task Force; two of those sites are in the San Gabriel River Watershed: Lakewood/Cerritos and Cal Polytechnic University Pomona. The Lakewood/Cerritos site is a 15 acre vacant parcel along the river. The site offers potential linkages with other adjacent habitat and park areas and the adjacent river channel could provide water for a potential project. The Cal Poly Pomona site is a 67 acre site on the campus currently cultivated with experimental plots for agricultural production. The site is adjacent to South San Jose Creek and a potential multi-objective project could involve opening off-channel wetlands or riparian habitat adjacent to the currently channelized creek.</p>

Watershed	Los Angeles River
Existing conditions	The watershed encompasses 53,4420 acres and 801 square miles of waterways. There are 51 dams in this watershed. The Los Angeles River enters San Pedro Bay at Queensway Bay in the southeastern corner of the City of Long Beach. Virtually the entire main channel of the river has been channelized and paved except for the tidal prism where soft bottom persists with some remaining wetlands habitat and in a stretch of the river near downtown Los Angeles where a high water table precludes use of concrete. Many tributaries originate in either the Santa Monica or San Gabriel Mountains where they have year-round flow due to springs and support high quality habitat.
Description of Watershed Resources	<p>Area: 534420.47 acres</p> <p>Naturally Occurring Waterways: 801.28 miles</p> <p>Percentage of Free Flowing River Miles: 84 %</p> <p>Percentage of River Miles in Protected Lands: 0 %</p> <p>Protected Lands: 0 %</p> <p>Number of Dams: 51</p> <p>Number of Selected Watershed Projects: 8</p> <p>Number of Stream Crossings: 1446</p> <p>Near-Stream Roads: 563.37 miles</p> <p>Average Precipitation per Year: 20.09 inches</p> <p>Number of Special Status Species: 20</p>
Status of Watershed Planning Efforts	<p>There are a number of watershed planning efforts in various stages of development. Proposition 13 funds are going toward subwatershed plan development in Compton Creek, the Arroyo Seco, and the Rio Hondo. These efforts have just begun. An ongoing subwatershed planning effort is taking place in the Sun Valley part of the watershed.</p> <p>A Los Angeles River Master Plan was developed in 1996 that plans for a network of parks, trails, natural areas, and community spaces along the river's length.</p> <p>The San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy has produced a draft Guiding Principles Watershed and Open Space Plan which may be viewed at http://www.rmc.ca.gov/. The Conservancy was established in 1999 as an independent State agency to preserve urban open space and habitats in order to provide for low-impact recreation and educational uses, wildlife and habitat restoration and protection, and watershed improvements within its jurisdiction.</p> <p>The Los Angeles and San Gabriel Rivers Watershed Feasibility Study Advisory Task Force has recently developed recommendations for consideration by the Board of Supervisors for restoration opportunities in the two watersheds. The Task Force was formed in 1998 to identify opportunities to improve recreation, land use and habitat management, watershed conservation, water quality and flood control and to develop a framework for a future integrated basin management plan for the two watersheds.</p>
Restoration Goals and Objectives	The Coastal Conservancy, Los Angeles Regional Water Quality Control Board, and Los Angeles Department of Public Works are conducting a comprehensive assessment of the wetland resources of the Los Angeles River and its watershed. The assessment

Related to Wetlands	<p>will provide the basis for planning habitat enhancement and restoration, and recreational projects along the river.</p> <p>Several agencies and community groups have proposed alternatives for watershed and flood control measures to deal with a 100 year flood. The Los Angeles River Flood Control Strategy Task Force was established in 1996 to investigate and make recommendations on these various methods and options. In 1997, the RWQCB began a Watershed Management Initiative for the Region which is primarily a volunteer monitoring program for the watershed.</p> <p>A sample of restoration and conservation efforts in the greater watersheds of the LA River include:</p> <ul style="list-style-type: none"> • <u>Taylor Yard.</u> Taylor Yard is an old railroad marshaling yard across from Elysian Park, north of downtown Los Angeles. It is approximately 190 acres with over a two mile frontage on the river. Most of it is being abandoned by Union Pacific Railroad Company. There are existing plans and community support for using much of the property as a combination storm water detention basin and park with soccer fields, wetlands, and riparian habitat. Taylor Yard could protect parts of downtown Los Angeles from flooding during a 100-year storm. However, some of it is being sold for industrial development. At least 61 acres will be reserved for the above uses. The California Coastal Conservancy is funding a feasibility study and master plan with a \$250,000 grant. Money is needed to purchase the 61 acres and develop it as described above. • <u>Chinatown Yards.</u> The Midway and the Cornfields railroad yards are known as the Chinatown yards. They are located near downtown LA along the LA River. These railroad yards have also been abandoned. FoLAR's charette "The River through Downtown", suggested an extensive mixed use for this project and a way to restore the original Zanja Madre, the irrigation ditch that brought water from the Los Angeles River to the Pueblo de Los Angeles, and to flood the Cornfields. The restored habitat, open space, and water features could help to stimulate redevelopment of the hills surrounding the Cornfields much like the San Antonio River Walk. Midway could provide opportunities for riparian habitat restoration. Both yards are needed for the bike path that will connect the river to Union Station, downtown, and to provide additional flood protection for downtown. • <u>Arroyo Seco/Los Angeles River Area.</u> A large triangle of land is located where the Arroyo Seco (a major tributary of the LA River) meets the Los Angeles River. The land is needed to fulfill several functions: to mark the confluence where the original pueblo was located, to reconfigure the confluence itself to a more naturalized delta shape, restore it to an appropriate prominence in the landscape, and to provide much needed park and open space in a highly industrialized and park deprived area of the city. FoLAR has created a design for a cultural/historic confluence park to memorialize the birthplace of Los Angeles. The proposed blue line light rail to Pasadena will have a station stop at 26th Avenue, which can be linked with a pedestrian path to the park. The bike path from Pasadena to Union station will pass through the park. • <u>Hazard Park Wetland.</u> The Hazard Park wetland is located on an old abandoned
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	<p>railroad spur, which bisects Hazard Park in east Los Angeles near the County USC Medical Center. The entire 1.4 miles long spur ends at a Macy's distribution center that no longer uses the rail spur. The park is bisected by an abandoned railroad spur line. A small perennial source of water is present, most likely a spring. It supports a cattail-dominated marsh. Vegetation across most of the corridor outside the wetland is composed of exotic species and pavement. Native bird diversity is very high. The wetland already serves as an outdoor classroom since it adjoins a medical magnet high school with an involved science department. The trail or bike path could connect Hazard Park to Lincoln Park to the Ascott Hills. These hills are surrounded by public schools with environmental magnets, who are using the hills as an outdoor classroom. The City of Los Angeles has expressed interest in developing the trailway. A Preliminary Hydrologic Evaluation, Baseline Biological Analysis, and Conceptual Wetland Restoration plan have already been prepared by the LASG Rivers Watershed Council funded through a grant by the California Coastal Conservancy. Land acquisition and Final Restoration plans and construction are pending.</p>
List of Major Restoration Activities	<p>Vision 2025 of the Los Angeles-San Gabriel Watershed Council focuses on the following long-term restoration goals:</p> <ul style="list-style-type: none"> Managing the watershed for economic vitality and environmental health; Using all water resources efficiently; Managing the forest for water supply and quality; Creating greenways and educational facilities; Restoring habitat for fish, birds and wildlife, and Improving water quality. <p>The Los Angeles and San Gabriel Rivers Watershed Feasibility Study Advisory Task Force the Board of Supervisors request the Army Corps of Engineers begin startup work for the top three sites (by the defined criteria) recommended by the Task Force; one of these sites is in the Los Angeles River Watershed. The Headworks site is a 46 acres parcel along the river owned by the Los Angeles Department of Recreation and Parks with an easement held by the Department of Water and power. The site, which is currently unused, is largely open, is adjacent to the channel, and is relatively low in elevation.</p>

Watershed	Ballona Creek
Existing conditions	Ballona Creek is one of the largest drainages of the greater Santa Monica Bay watershed at 128 square miles. The creek drains the west central area of Los Angeles, and the eastern portion of the Santa Monica Mountains. A large majority of the creek is channelized and paved. There is little riparian habitat remaining in the creek. The Ballona wetlands are connected to the creek by four concrete and metal culverts. As a consequence, there is no tidal flow into the wetlands.
Description of Watershed Resources	The Belding's savannah sparrow breeds in the wetlands. Fish and invertebrate communities are common species.
Status of Watershed Planning Efforts	A Proposition 13-funded subwatershed plan effort has just begun.
Restoration Goals and Objectives Related to Wetlands	<p>A comprehensive restoration plan for the Ballona wetlands is one focus of the Santa Monica Bay Restoration Project (1993). Other objectives are to:</p> <ul style="list-style-type: none"> • Enhance water quality; • Improve tidal action within wetlands; • Expansion of tidal channels; • Increasing the size and number of culvert connections that separate wetland areas; • Re-establish wetland and transition zone vegetation; • Creation of habitat diversity; • Protect nesting habitats within wetland complex, and • Control public access.
List of Major Restoration Activities	In order to improve water quality, a 50 acre riparian and freshwater marsh system has been authorized by the CCC and COE.

Watershed	Santa Monica Bay Hydrologic Unit (Topanga Creek, Malibu Creek, Solstice Creek, Trancas Creek)
Existing conditions	<p>The watershed encompasses approximately 400 square miles that is subdivided by 28 separate drainages. The watershed includes the topographic features of the Santa Monica Mountains and the LA coastal plain. These topographic features affect the distribution of wetlands and the historical changes that have occurred with the watershed, e.g., land-use and industrial development activities.</p> <p>The Bay watershed is one of the nation's most highly urbanized areas. The two largest watershed are Malibu Creek within the Santa Monica Mountains and Ballona Creek within the Los Angeles coastal plain.</p> <p>The landscape of the watershed includes rugged coastal mountains and broad alluvial valleys and coastal dunes. The Santa Monica Mountains include a number of deep and narrow canyons, which flow through 19 major watersheds to the Pacific Ocean. Topanga, Malibu, Solstice, and Trancas Creeks are the major watersheds of the Mountains. Many of these sub-watersheds include relatively healthy riparian habitats, due to the fact that most of the canyons of the Mountains remain as open space and are undeveloped. There are 400 miles of riverine wetlands with the Santa Monica Bay watershed. Thousand Oaks, Malibu Beach, and Point Dume have the majority of the watershed's wetlands because of the extensive riparian habitats associated with the intermittent creeks and streams. Riparian and floodplain forests are located in the Malibu, Calabasas, Topanga and Point Dume areas.</p>
Description of Watershed Resources	<p>Area: 364554.04 acres Naturally Occurring Waterways: 438.18 miles Percentage of Free Flowing River Miles: 78 % Percentage of River Miles in Protected Lands: 20 % Protected Lands: 12 % Number of Dams: 22 Number of Selected Watershed Projects: 17 Number of Stream Crossings: 848 Near-Stream Roads: 349.38 miles Average Precipitation per Year: 16.73 inches Number of Special Status Species: 28</p>
Status of Watershed Planning Efforts	<p>Santa Monica Bay Restoration Plan (1993). A watershed group in Topanga has prepared a draft Topanga Watershed Management Plan. A Natural Resources Plan was prepared for the Malibu Creek Watershed in 1995 by the Natural Resources Conservation Service.</p>
Restoration Goals and Objectives Related to Wetlands	<p>As described in the SMBRP's Wetland Inventory Restoration Potential (1993), the following goals and objectives related to wetlands are described:</p> <ul style="list-style-type: none"> • Enhance water quality; • Improve tidal action within wetlands; • Expansion of tidal channels; • Increasing the size and number of culvert connections that separate wetland areas; • Re-establish wetland and transition zone vegetation; • Creation of habitat diversity;

	<ul style="list-style-type: none"> • Protect nesting habitats within wetland complex, and • Control public access.
Anadromous Fish	<p>Big Sycamore Canyon Creek: Relatively low restoration potential exists due to lack of perennial stream flows.</p> <p>Arroyo Sequit Creek: Juvenile and adult steelhead were observed most years from 1993. Steelhead juveniles were found ~2 miles (3.2km) upstream from Leo Carrillo State Beach Park in 1980. Larger fish were rescued from 1- 3 miles in 1998 and relocated within the drainage. Excellent native riparian vegetation with a remnant lagoon exists.</p> <p>Solstice Creek: A spring fed perennial creek, with good riparian and large portion of federal ownership. Water quality and quantity in the creek appears capable of supporting small numbers of juvenile steelhead in the most suitable habitat. Fish passage projects are proposed.</p> <p>Malibu Creek: Juvenile steelhead abundance is highest in the upper gorge reach 0.5 mi., directly below Rindge Dam. Fish passage at the dam would allow access to 4.8 mi. of potential steelhead habitat (23% of useable rearing and 56% of useable spawning habitats estimated to be good to excellent). Summer stream flows have been supplemented from the late 1960's up to 1999 by discharges of the Tapia Water Reclamation Facility. A 10 foot natural bedrock waterfall exists beneath the deposited sediments behind Ringe Dam, but most biologists do not believe it will be a barrier to fish passage.</p> <p>Topanga Creek: A few adult fish have been observed in the lower part of the creek in recent years.</p>
List of Major Restoration Activities	<p>Santa Monica Bay Restoration Project major goals include the protection, restoration and creation of wetlands within the Bay watershed. The Bay Restoration Project (1993) also focuses on the protection and restoration of Topanga Creek, Malibu Creek, Solstice Creek, and Trancas Creek (as well as the Ballona wetlands). As followup to those major goals, the potential restoration of Topanga Lagoon is being investigated through a Topanga Lagoon Restoration Feasibility Study being headed up by the SM Mountains RCD. Also, the Malibu Lagoon Task Force, a group within the Malibu Creek Watershed Council, underwent a facilitated process to finalize prioritization of potential wetlands restoration sites in the lower watershed previously identified by UCLA. Funding is being pursued to begin such work.</p>

Watershed	Calleguas Creek
Existing conditions	The Calleguas Creek Watershed area is 30 miles long, 14 miles wide and has an area of approximately 343 square miles (approximately 224,000 acres). It extends from the Los Angeles County line in the east to Mugu Lagoon and the Pacific Ocean to the south. The watershed includes Calleguas Creek, Conejo Creek, Arroyo Los Posas, Arroyo Conejo, Arroyo Santa Rosa and Arroyo Simi, along with Revolon Slough and Mugu Lagoon. The northern boundary of the watershed is formed by the Santa Susana Mountains, South Mountain and Oak Ridge; the southern boundary is formed by the Simi Hills and Santa Monica Mountains. Discharges of municipal, agricultural, and urban wastewaters have increased surface flow in the watershed, which has resulted in increased sedimentation and water pollution in the Mugu Lagoon as well as contaminated sediments in the lower part of the watershed. A naval facility is located at the lagoon.
Anadromous Fish	No fish passage impediments noted in lower reach of the Calleguas Creek have been identified for steelhead. The farthest upstream limit is due to 15 ft. drop structures located at Simi Valley (Madera Rd.). There is low quality adult resting habitat and poor quality juvenile rearing habitat (sediment).
Description of Watershed Resources	<p>Area: 242578.07 acres</p> <p>Naturally Occurring Waterways: 483.15 miles</p> <p>Percentage of Free Flowing River Miles: 77 %</p> <p>Percentage of River Miles in Protected Lands: 0 %</p> <p>Protected Lands: 0 %</p> <p>Number of Dams: 6</p> <p>Number of Selected Watershed Projects: 6</p> <p>Number of Stream Crossings: 832</p> <p>Near-Stream Roads: 353.18 miles</p> <p>Average Precipitation per Year: 15.06 inches</p> <p>Percentage Area above 15% Slope: 7.77 %</p> <p>Number of CalWater Units: 11</p> <p>WBS TMDL Rivers 18</p> <p>Number of Special Status Species: 22</p>
Status of Watershed Planning Efforts	<p>The Calleguas Creek Draft Watershed Management Plan, with its broad stakeholder participation and support, has an opportunity to address long range comprehensive water resource issues; land use; economic development; open space preservation, enhancement and management issues; and public facility provision strategies. The Plan will examine existing data, and develop a characterization of the watershed.</p> <p>The Plan will give balanced consideration to habitat conservation, hydrology, land use, regulatory processes, agriculture, flood control, soil conservation, water quality and quantity, water conservation, habitat preservation, species endangerment, recreation, private property rights, economics and overall community objectives.</p>
Restoration Goals and Objectives Related to Wetlands	The Navy has undertaken 3 wetland restoration projects since 1995, resulting in a total of 23.5 acres of tidal mudflat, sandflat, channels, ponds, salt marsh and sand islands; mitigation plans were being developed in early 1997 for restoration of a 37-acre site to predominantly salt marsh. Several studies focused on reducing flooding and sedimentation have led to installation of sediment control structures, stream bank stabilization projects, on-farm sediment basins, and adoption of range management practices. Local communities have also instituted grading and hillside erosion control

	<p>ordinances.</p> <p>The Habitat Subcommittee of the Calleguas Creek Management Plan Committee contracted out development of a Wetlands Restoration Plan for the watershed. This Plan is available at http://www.calleguas.com/ccwrp.PDF.</p>
List of Major Restoration Activities	<p>Additional watershed-related planning efforts underway, include Calleguas Creek Watershed Treatment, , and Ventura County Punagrass Control.</p> <p>Calleguas Creek Watershed Treatment Phase I-II is a comprehensive effort to protect resources within the Calleguas Creek watershed and at the outlet, Mugu Lagoon. This project will demonstrate subwatershed channel stabilization through the use of grade stabilization and streambank restoration. Phase I of the project addresses priority subwatersheds of the Calleguas Creek Watershed. Selected conservation practices and technical assistance will improve water quality by reducing erosion, runoff and sediment transport to downstream water bodies. Phase 2 will focus on subwatershed channel stabilization through the use of grade stabilization and streambank restoration.</p>

Watershed	The Oxnard Plain between Calleguas Creek and Santa Clara River Watersheds
Existing conditions	The Oxnard Plain is the lower drainage area of the greater Santa Clara-Calleguas Hydrological Unit. Much of it lies between the two major watersheds in the area and drains separately to the ocean through highly modified lagoon or wetlands. The Oxnard Plain is predominantly agricultural and residential lands. Large reserves of ground water exist in alluvial aquifers underlying the Oxnard Plain. Residential development is threatened the major wetland complex of the area at Ormond Beach.
Description of Watershed Resources	See watershed statistics under Calleguas Creek and the Santa Clara River Basin.
Status of Watershed Planning Efforts	The Ormond Beach Task Force and Ormond Beach Observers meet on an irregular basis but otherwise no wider spread watershed planning activities are occurring.
Restoration Goals and Objectives Related to Wetlands	Acquire 610-acres of wetlands and dunes parcels at Ormond Beach owned by Southern California Edison.
List of Major Restoration Activities	<p>Ormond Beach Edison Acquisition</p> <p>The Ormond Beach Edison site is approximately 600 acres on the coast south of the City of Oxnard located between Edison Drive and Arnold Road.</p> <p>Approximately 300 acres of the site are in agricultural use, 140 acres are in wetlands and dunes, and a tank farm covers 55 acres. Acquisition would allow for enhancing the existing degraded wetlands and potentially tripling the extent of wetlands and associated habitat on site. Anticipated restoration would include modifications of the site hydrology to reintroduce tidal action and bring back freshwater flows that had formerly drained across the Oxnard Plain to the coastal wetlands.</p> <p>McGrath Lake Oil Spill Restoration Project</p>

Watershed	Santa Clara River
Existing conditions	<p>The Santa Clara River Watershed (approximately 1,200 square miles) contributes water to the Santa Clara River Estuary. Dams in the watershed of the Santa Clara River include Bouquet Reservoir (built in 1934), Lake Piru (built in 1955), and Pyramid and Castaic Lakes, which control about 37% of the watershed.</p> <p>The Santa Clara River is the last unchannelized riparian and wildlife corridor in the region. Extensive patches of high quality riparian habitat are present along the length of the river and its tributaries. The endangered fish, the unarmored threespine stickleback, is resident in the river. One of the largest of the Santa Clara River's tributaries, Sespe Creek, is designated a wild trout stream by the state of California and supports significant spawning and rearing habitat. The Sespe Creek is also designated a wild and scenic river. Piru and Santa Paula Creeks, which are tributaries to the Santa Clara River, also support good habitats for steelhead.</p> <p>The Vern Freeman Diversion Dam may impede the upstream migration of endangered southern steelhead trout. River flows below the dam may not be adequate to keep endangered southern steelhead trout in good condition at all times.</p>
Description of Watershed Resources	<p>Area: 1032302.26 acres Naturally Occurring Waterways: 2623.92 miles Percentage of Free Flowing River Miles: 94 % Percentage of River Miles in Protected Lands: 21 % Protected Lands: 20 % Number of Dams: 8 Number of Selected Watershed Projects: 8 Number of Stream Crossings: 2649 Near-Stream Roads: 1022.48 miles Average Precipitation per Year: 19.42 inches Percentage Area above 15% Slope: 35.58 % Number of CalWater Units: 14 WBS TMDL Rivers 9 Number of Special Status Species: 26</p>
Anadromous Fish	<p>Access to the upper river is limited by sandy substrate and low flows. The lower mainstem is primarily a migration corridor for steelhead and is less used as a spawning and rearing area, with the exception of the estuary. The Vern Freeman Diversion was equipped with a fish ladder and intake screens in 1989 and became operational in March 1991. A downstream migrant trap at the Diversion collects steelhead smolt data.</p>
Status of Watershed Planning Efforts	<p>The purpose of the Santa Clara River Enhancement and Management Plan is to resolve conflicts among competing uses in the Santa Clara River while protecting the natural resources of the river. The key issues and concerns under negotiation include: Agriculture, Erosion / Sedimentation, Fisheries, Fisheries-Freshwater, Flood Control, Mining, Recreation, Riparian Enhancement , Stream Bank Protection, Vegetation, Water Quality, Water-Surface Water, Water Quantity/Supply, Wetlands, and Habitat.</p>
Restoration Goals and	<p>To protect and restore Least Bell's Vireo (<i>Vireo bellii</i> ssp. <i>Pusillus</i>), Steelhead Trout (<i>Oncorhynchus mykiss gairdneri</i>) and Unarmored 3-spine Stickleback (<i>Gasterosteus</i></p>

Objectives Related to Wetlands	aculeatus williamsoni).
List of Major Restoration Activities	Friends of the Santa Clara River will be doing a restoration project on 220 acres of river terrace property 3 miles upstream of Santa Paula, a portion of the Valley View Ranch, starting in 2002. The Coastal Conservancy is purchasing the property and Friends of the Santa Clara River will manage it.

Watershed	Ventura River
Existing conditions	<p>The Ventura River watershed encompasses 228 square miles, and is 31 miles long. Its two principal tributaries are San Antonio Creek from the east and Coyote Creek from the west. The annual average flow of the Ventura River is 13,600 acre-feet. The river is highly fluctuating and intermittent in some stretches, running usually only in the winter month's "wet season" while flowing year-round in other stretches fed by rising groundwater. The area averages 14 inches of precipitation per year, with ranges varying from 5 to 40 inches. The Ventura River ecosystem supports 23 species of special concern.</p> <p>Completed in 1959, Casitas Dam is the key component of the Ventura River Project. Casitas Dam is located on Coyote Creek about 2 miles above the junction of the creek and the Ventura River. Robles Diversion Dam is located on the Ventura River about 1.5 miles downstream from the confluence of Matilija Creek and North Fork Matilija Creek. The structure is rockfilled with a timber cutoff wall and a rolled earth core. The dam diverts water into the headworks of the Robles-Casitas Canal.</p> <p>Robles-Casitas Canal carries water from Robles Diversion Dam to Lake Casitas. The canal is about 4.5 miles long with a capacity of 500 cubic feet per second. There are 4.5 miles of concrete canal and 0.9 mile of 78-inch reinforced concrete pipe, called the Robles-Casitas Diversion Conduit.</p> <p>In addition to the steelhead, species found along the river include the California condor, California red-legged frog, and California Brown pelican. The major issue within this watershed is the dramatic historical decline of the southern steelhead, which is an indication of the general health of the aquatic ecosystem. More than 5,000 steelhead formerly migrated up the river and Matilija Creek before the dam was built in 1948. Now, less than 100 fish make their way up the river. The dam blocks access to more than 20 miles of some of the best remaining steelhead habitat in southern California.</p> <p>Much of the upper parts of the watershed are protected as part of the Matilija Wilderness. Removal of Matilija Dam would provide fish passage to historic breeding waters in the upper watershed, and greatly enhance the opportunities for restored habitat for many other species of concern.</p>

Description of Watershed Resources	<p>Area: 173629.76 acres Naturally Occurring Waterways: 461.12 miles Percentage of Free Flowing River Miles: 92 % Percentage of River Miles in Protected Lands: 11 % Protected Lands: 12 % Number of Dams: 6 Number of Selected Watershed Projects: 4 Number of Stream Crossings: 559 Near-Stream Roads: 254.02 miles Average Precipitation per Year: 25.68 inches Percentage Area above 15% Slope: 41.43 % Number of CalWater Units: 21 WBS TMDL Rivers 7 Number of Special Status Species: 6</p>
Anadromous Fish	<p>Small numbers of adult steelhead have been reported in most years. Robles Diversion Dam (1958) diverts water to Casitas Reservoir on Coyote Creek, and causes de-watering of the lower river and blocks steelhead migration. Above the Diversion Dam, riparian vegetation is abundant with good spawning and rearing habitat. Habitat just below the Diversion Dam is generally poor. Further downstream at Casitas Springs ("The Narrows") is very good habitat with thick riparian cover, abundant spawning areas and perennial flows present.</p> <p>The Matilija Dam (constructed in 1948) is located 16.2 miles upstream. Access to almost all of Matilija Creek is blocked by Matilija Dam (1948). Below the dam, spawning habitat is scoured and poor but rearing habitat is fair due to constant surface flow. This creek is considered the key to restoring steelhead in Ventura system. Many of the tributaries of the Matilija Creek would provide suitable habitat if the dam is removed (e.g, Murrieta Creek, Old Man Canyon Creek, Upper North Fork Matilija Creek).</p>
Status of Watershed Planning Efforts	<p>The Ventura River Watershed Planning effort started in 1996 and has received funding from the Coastal Conservancy. The project targets the creation of a watershed management plan for the Ventura River watershed that can provide a framework for dealing with a wide range of issues on public and private lands. The plan will also tie together a number of on-going, separate resource management programs (e.g., estuary restoration, steelhead management, recreation trail, among others). The purpose of the effort is to develop a comprehensive watershed management plan for the Ventura River watershed.</p> <p>Ventura River Steelhead Restoration and Recovery Plan Group A Plan was developed in response to the listing of steelhead trout as an endangered species by the National Marine Fisheries Service (NMFS) in August 1997. The plan was developed 1) to identify measures to mitigate impacts of ongoing operations and maintenance activities, 2) to identify future projects and, 3) identify and evaluate opportunities to promote recovery and restoration of the steelhead trout in the watershed. One staff person will continue to remain involved with the group, as needed.</p> <p>Ventura River Habitat Conservation Plan (HCP) Group: The group, mostly comprised of resource agencies, cities, and water districts, began meeting in 2000. The cities and water districts involved all operate and maintain facilities that may affect sensitive</p>

	<p>resources or their habitats in the river. In order to comply with the Endangered Species Act they are engaging in consultation with the National marine Fisheries Service and US Fish and Wildlife Service and are in the process of developing a HCP that, with monitoring program and implementation agreements, would serve as the basis for an Incidental Take Permit.</p> <p>Matilija Dam Steering and Executive Committees: The USACE, Ventura County Flood Control District, US Bureau of Reclamation, and other agencies and entities began convening in 2000 to begin discussions on the possible removal of Matilija Dam as part of an ecosystem restoration. An USACE and VCFCD sponsored feasibility study will begin shortly to consider the benefit to the ecosystem from various alternatives.</p>
Restoration Goals and Objectives Related to Wetlands	<ul style="list-style-type: none"> • Erosion and sedimentation control; • Riparian enhancement, and • Habitat restoration.
List of Major Restoration Activities	<p>Restoration activities involve the planning for the removal of dams, erosion / sedimentation control, the restoration of southern steelhead trout, riparian enhancement, stream bank protection, water quality management, and wetland restoration.</p> <p>As part of the dam removal planning, consideration will be given to providing access and day-use recreational facilities, extension of the coast-to-mountain bicycle trail, outdoor educational facilities, and acquisition of non-federal inholdings in the Los Padres National Forest.</p> <p>The Bureau of Reclamation has initiated an appraisal study to be completed in the spring of 2000. Congress allocated \$100,000 to study the dam's removal. A demonstration project to commence decommissioning of the dam occurred in the fall of 2000, before the Secretary Babbitt left office.</p>

Watershed	South Coast Hydrologic Unit (Rincon Creek, Franklin Creek)
Existing conditions	<p>The South Coast Hydrologic Unit contains the watersheds of Rincon, Gobernador, Carpinteria, Franklin, and Santa Monica creeks, and streams in Arroyo Paridon and Toro Canyon. These streams are relatively short; all but two have separate drainage basins. They generally have perennial flows in the headwater areas. The upper reaches of these creeks contain foothills, with the exception of Santa Monica Creek, which has the Santa Ynez Mountains to the north. The slopes of the foothills and the Santa Ynez Mountains are covered by chaparral vegetation that grades into avocado orchards, open agricultural fields, and urban development in the foothills and coastal plain.</p> <p>There are many types of impairments to the southern end of these creeks, which exist in an urban setting of the watershed, and are located on private property. These impairments include channelization, concrete lining, poor and ineffective bank protection, excessive sedimentation, poor water quality, lack of in-channel vegetation, invasive non-native species, reduced canopy cover and excessive use by human beings.</p> <p>The watershed of the Carpinteria Marsh is one important feature of this hydrological unit. The sub-watershed encompasses 6,600 acres, and includes the tributaries of Santa Monica and Franklin Creeks (and a smaller unnamed drainage to the west of Santa Monica Creek). The Carpinteria Salt Marsh is one of the most important wetlands in this subregion. The marsh is the northwestern geographic limit for many species, Shoregrass, Belding's Savannah Sparrow, and Light-footed Clapper Rail.</p> <p>A synopsis of the findings (Ferren 1985) has shown that at least 55 vascular plants families containing 153 genera and 252 species are known to occur or have occurred at Carpinteria Salt Marsh, including the estuary's historical limits and adjacent sand dunes. Of those plants, 104 species (45%) are native. Eleven species listed for Carpinteria Salt Marsh and vicinity are possibly extirpated, representing 17% of the 64 native wetland species. Eleven species growing presently at the estuary are regionally rare plants, and two species (Salt Marsh Bird's-beak and Salt Marsh Goldfields) are considered endangered. Due to the disturbance of the upper watersheds (channelization, degradation of riparian habitats, and culverts) that lead to the marsh, Ferren (personal correspondence, 2001) believes the watershed can no longer serve the needs of southern steelhead trout.</p> <p>At least 190 bird species, 37 fish species, 11 mammal species, 5 herpetofauna species, and over 100 invertebrate species have been observed, collected, or reported from Carpinteria Salt Marsh.</p>

Description of Watershed Resources	<p>Area: 240719.88 acres</p> <p>Naturally Occurring Waterways: 632.83 miles</p> <p>Percentage of Free Flowing River Miles: 87 %</p> <p>Percentage of River Miles in Protected Lands: 1 %</p> <p>Protected Lands: 1 %</p> <p>Number of Dams: 11</p> <p>Number of Selected Watershed Projects: 10</p> <p>Number of Stream Crossings: 951</p> <p>Near-Stream Roads: 400.36 miles</p> <p>Average Precipitation per Year: 22.78 inches</p> <p>Percentage Area above 15% Slope: 29.26 %</p> <p>Number of CalWater Units: 31</p> <p>WBS TMDL Rivers 4</p> <p>Number of Special Status Species: 23</p>
Anadromous Fish	<p>Within the watershed, several creeks provide suitable riparian and/or spawning habitat that could support southern steelhead runs, including:</p> <ul style="list-style-type: none"> • Arroyo Burro Creek (supports good riparian habitat but there are many barriers (culverts) and poor water quality; • Mission Creek (several migration barriers exist) • Rattlesnake Creek (a debris dam is located 800' upstream) • Sycamore Canyon Creek (suitable habitat, riparian canopy and deep channel) • Montecito Creek (but ten partial barriers are present) • Cold Springs Creek • Hot Spring Creek • San Ysidro Creek <p>Other creeks of the area may provide suitable habitat but also include various major barriers to passage. Carpinteria creek, for example, includes excellent habitat in the foothills. Juveniles have been seen every year since the 1980s. Rincon creek has good instream habitat and the creek bed is natural with the exception of the culvert at Highway 101.</p>
Status of Watershed Planning Efforts	<p>The Management Plan for Carpinteria Salt Marsh Reserve is a comprehensive, ecosystem-wide planning document that has been funded by the University of California and by the California State Coastal Conservancy through a grant to the UCSB Marine Science Institute and the UCSB Museum of Systematics and Ecology within the Department of Ecology, Evolution, and Marine Biology. The general purpose of the Management Plan is to provide a mechanism for the integration, under one management structure, of the protection, management, and use of Carpinteria Salt Marsh and its biological and physical resources at an ecosystem level rather than a parcel level.</p> <p>There are also a number of smaller-scale efforts, such as the Atascadero Creek Sedimentation Study, Carpinteria Valley Watershed Project, and the San Jose Creek Restoration Project. The purpose of the San Jose Creek Restoration Project is to enhance native riparian vegetation along the creek, improve the area's aesthetics, and facilitate passive recreation within the riparian corridor.</p>
Restoration Goals and	<p>The Management Plan for the Carpinteria Salt Marsh Reserve includes the following goals and objectives:</p>

Objectives Related to Wetlands	<ul style="list-style-type: none"> • Protect and maintain the estuarine ecosystem at CSMR and its physical, biological, and cultural resources, diversity, and functions. • Extend CSMR boundaries to bring sensitive lands under Reserve management, Acquisition and Easements. • Pursue acquisition, conservation easements, and/or cooperative agreements to ensure the preservation and appropriate management of Carpinteria Salt Marsh parcels and resources. • Protect the resources and functions of the Carpinteria Salt Marsh through careful implementation of the Management Plan and Coordination Program. • To the maximum extent feasible, the mouth of Carpinteria Salt Marsh should remain open to maintain optimal tidal Circulation. • To the maximum extent feasible, enhance and restore the estuary's natural diversity of resources, habitats, physical processes, and functions through the enhancement and restoration of natural self-sustaining processes. • Identify sites throughout the estuary and develop plans where restoration, enhancement, or other beneficial activities should be implemented to improve the quality of the ecosystem. • Implement plans designed to restore or enhance the quality of the estuarine ecosystem at CSMR. • Evaluate the need for increasing circulation and improving water quality in the north marsh area and, if appropriate, implement the recommendations of the study. • Coordinate restoration and enhancement activities for endangered species. • Coordinate restoration and enhancement activities for the removal of exotic species • Channel Enhancements (Franklin and Santa Monica Creeks and Basin III) • South Marsh Enhancements • Estuary Mouth Enhancements, Reconfiguration and Dune Restoration North Marsh Enhancements
List of Major Restoration Activities	See above and http://nrs.ucop.edu/CSMR_Management_Plan/Web_Pages/CSMR-Title.html for additional information.

Watershed	Goleta Slough (Atascadero, San Jose, Las Vegas, San Pedro, Carneros, Tecolotito Creeks)
Existing conditions	The Goleta watershed encompasses 45 square miles. The tributaries of the watershed include Tecolotito Creek, Carneros Creek and Atascadero Creek. The upper reaches of these creeks include foothills and the Santa Ynez Mountains to the north. The slopes of the foothills and the Santa Ynez Mountains are covered by chaparral vegetation that grades into avocado orchards, open agricultural fields, and urban development in the foothills and coastal plain. There are many types of impairments to the southern end of these creeks, which exist in an urban setting of the watershed and are located on private property. These impairments include channelization, concrete lining, poor and ineffective bank protection, excessive sedimentation, poor water quality, lack of in-channel vegetation, invasive non-native species, reduced canopy cover and excessive use by humans.
Description of Watershed Resources	A report (1996) synthesized a variety of biological surveys (dates not specified). In this report, 279 species were identified at Goleta Slough of which 121 species were water associated, including 20 species of special status. In a 1994, 117 pairs of Belding's Savannah sparrows were observed nesting in the slough. In a 1995 survey, a California horned lark was observed. A 1996 report identified 20 special status species, including California brown pelican, southern bald eagle, peregrine falcon, snowy plover, sandhill crane, common loon, American white pelican, double-crested cormorant, white-faced ibis, fulvous duck, harlequin duck, northern harrier, golden eagle, osprey, long-billed curlew, California gull, elegant tern, and black skimmer.
Anadromous Fish	<p>Within the Goleta Slough watershed, several drainages with potential for southern steelhead restoration include:</p> <ul style="list-style-type: none"> • Tecolote Canyon Creek (however, flood control dams, diversion dams, and culverts prevent passage); • Glen Annie Creek (upper portion includes suitable habitat, but culverts act as major barriers) and Tecolotito Creek (lower portion of same system that includes good habitat but also major barriers to passage); • Carneros Creek (good habitat in the Santa Ynez mountains but barriers prevent passage); • San Pedro Creek (includes well-developed riparian canopy with intermittent flow); • San Jose Creek (however, the lower portion of the creek is channelized with no pools for fish); • Atascadero Creek; • Maria Ygnacio Creek (with debris basins that prevent passage), and • San Antonio Creek (with debris basins that prevent passage). <p>There remain several barriers caused by roads and other small dams and culverts (primarily under Highway 101) that prevent passage of steelhead within these streams. In addition, water diversions, small berms at the mouth of most creeks, and excess sediment have been noted in several creeks that could support a steelhead run. A summary of these barriers is found at http://swr.ucsd.edu/hcd/SoCalDistrib.htm.</p>

Status of Watershed Planning Efforts	<p>Several enhancement and maintenance plans have been put forth for the slough since the late 1980's, although none have been fully implemented. Many of the enhancement plans were driven by the proposed expansion of the Santa Barbara Municipal Airport and by flood control activities. The mitigation plan (1996) for the 'safety area grading project' at the airport proposes to: create transitional middle and high marsh habitats along the northern margin of the slough, remove selected berms, and establish native plants in the project area.</p> <p>The Goleta Slough Management Committee (GSMC) has been meeting since 1991 with the overall goal of resource protection and enhancement of Goleta Slough (http://www.audubon.org/chapter/ca/santabarbara/agency.htm). In 1996, the Committee prepared a draft Goleta Slough Ecosystem a Management Plan.</p>
Restoration Goals and Objectives Related to Wetlands	<p><u>Goleta Slough Restoration Project:</u> Members of the GSMC have been strong proponents of a major restoration project that would reestablish tidal circulation to parts of the historic Goleta Slough, where berms or tide gates have inhibited tidal action. The Coastal Conservancy has been awarded \$940,000 by the US Fish and Wildlife Service, from the National Coastal Wetlands Conservation Grant Program, for restoration of the upper Slough, on California Department of Fish and Game property, and the Storke Campus Wetlands of the University of California at Santa Barbara. Matching funds from a state program have been secured. Before implementation of the project, a study to address the wetland/bird strike safety issues with the Federal Aviation Administration is required.</p> <p>Pampas grass removal on the California Department of Fish and Game parcel was initiated in fall 1998 by Santa Barbara Audubon (SBAS).</p> <p>In September 2000, the EIR for the Goleta Slough Dredging Project was approved by the Board of Supervisors, which will provide beach nourishment and shore protection.</p> <p>The City of Santa Barbara's Creek Inventory and Assessment Study (URS Corporation 2000) describes the physical characteristics of the creeks within the watershed, and recommends several restoration activities to improve the general health and integrity of the Goleta Slough watershed.</p>
List of Major Restoration Activities	<p><u>Goleta Slough Estuarine Restoration.</u> The Conservancy has funded a restoration project to restore tidal circulation and estuarine wetland functions to 38 acres of the Goleta Slough. This restoration will benefit the Federally endangered light-footed clapper rail, as well as steelhead trout.</p>

Watershed	Devereux Creek [included in the greater hydrological unit for South Coast noted above]
Existing conditions	The southern part of the Gaviota Coast includes the Devereux Creek watershed. The watershed area encompasses 2330 acres. Devereux Slough is located on the West Campus of the University of California at Santa Barbara. The approximate wetland habitat acreage is 70. Historically, the slough is estimated to have been approximately 2 to 3 times its present size.
Description of Watershed Resources	290 species were documented at the slough and Coal Oil Point Reserve of which 118 are water-associated, including 15 species of special status. The white-faced ibis was recorded as nesting. Species status species identified include the common loon, American white pelican, brown pelican, double-crested cormorant, white-faced ibis, osprey, bald eagle, northern harrier, peregrine falcon, snowy plover, California gull, elegant tern, black tern, Belding's Savannah sparrow, and tricolored blackbird.
Status of Watershed Planning Efforts	<p>The UC Santa Barbara 1990 Long Range Development Plan (LRDP) designates the Coal Oil Point Natural Reserve as an Environmentally Sensitive Habitat Area (ESHA) and along the northern edge of Devereux Slough as Open Space. As a part of the UC National Reserve System (NRS), the area is reserved for habitat and wildlife preservation, public education, and academic research. In 1995 a 'Natural Areas Plan' was completed which identifies management opportunities for restoration and preservation of the habitats and species of slough.</p> <p>In accordance with the LRDP, restoration and enhancement of the South Finger of the slough began in 2000. The LRDP is currently under revision, with a focus on water quality concerns, future restoration activities, and the protection of the endangered Western snowy plover.</p>
Restoration Goals and Objectives Related to Wetlands	<ul style="list-style-type: none"> • Remove fill and re-contour the site; • Increase tidal action; • Control erosion; • Protect roosting areas for the least tern near dune habitats; • Remove exotic plants, such as ice plant, and • Plant native species, such as wild flowers, to attract pollinators.
List of Major Restoration Activities	See above.

Watershed	Gaviota Coast Creeks [included in South Coast Watershed above]
Existing conditions	<p>There are a total of 38 watersheds in the Gaviota coast. The importance of this coastal stretch of southern California is reflected in the fact that the area between Coal Oil Point and Point Sal comprises only 15% of Southern California's coast yet holds approximately 50% of its remaining rural coastline. This area includes relatively healthy coastal watersheds and wetlands because of the general lack of urban and suburban development.</p> <p>Within the Gaviota Coast watershed, several creeks have suitable spawning and rearing habitat for southern steelhead, including:</p> <ul style="list-style-type: none"> • Gaviota Creek; • San Onofre Creek; • Arroyo Hondo Creek (which may represent the best steelhead run in the southern part of Santa Barbara County); • Arroyo Quemado (with good habitat in the foothills); • Refugio Creek; • Gato Canyon Creek (but lower portions of the stream are dewatered), and • Dos Pueblos Canyon Creek (with excellent riparian habitat available). <p>There remain several barriers caused by roads and other small dams and culverts (under primarily Highway 101) that prevent passage of steelhead within these streams. In addition, water diversions, small berms at the mouth of most creeks, and excess sediment have been noted in several creeks that could support a steelhead run. A summary of these barriers is found at http://swr.ucsd.edu/hcd/SoCalDistrib.htm.</p>
Description of Watershed Resources	<p>The Gaviota coast is located in a transitional ecological region that lies at the northern and southern distributional limits of many plant and animal species. The watersheds of the area provides habitat for many special-status species, including federal- and state-listed threatened and endangered, proposed listed, and candidate plant and animal species as well as species of special concern. Recently, 14 major vegetation and habitat types were described on the Gaviota coast. More than 850 plant species, 53 mammal species, 315 bird species (115 breeding), 17 reptile species, and 10 amphibian species are found in these habitat types.</p>
Status of Watershed Planning Efforts	<p>There is no watershed plan for the entire hydrological unit.</p> <p>The major coastal watershed-based planning effort is associated with Vandenberg Air Force Base's Final Integrated Natural Resource Management Plan (October 1996).</p>
Restoration Goals and Objectives Related to Wetlands	Data unavailable.
List of Major Restoration Activities	Data unavailable.